

CD-Barcode and the CLD-V2600 / CLD-V2400

Introduction

Pioneer's CLD-V2600 & the CLD-V2400 play both LaserDiscs and audio compact discs. For the past 3 years LaserBarcode™ technology has been used to control laserdiscs. And now, with the introduction of the CLD-V2400 and the CLD-V2600, CD Barcode™ technology can be used to control audio compact discs.

This bulletin explains CD Barcode and the CD Barcode commands which are supported by the CLD-V2600 & CLD-V2400 players. For more information on audio compact discs, refer to **Technical Bulletin #138 - The CLD-V2600 / CLD-V2400 and CD Audio Basics**.

CD Barcode™

The CD Barcode format, like the LaserBarcode format, follows the interleaved 2 of 5 barcode specification for encoding player instructions into the barcode. This format uses two different widths of lines as well as two different widths of spaces between the lines. Using this scheme, more information can be encoded in the same space when compared to other encoding formats.

Because the same interleaved 2 or 5 encoding format is used for CD Barcode and LaserBarcode, Pioneer's barcode reader, model UC-V104BC, will scan and transmit both types of barcodes to the CLD-V2600 & the CLD-V2400. Pioneer's Bar'n'Coder supports the creation and printing of LaserBarcodes and CD Barcodes for Macintosh™. The LaserDisc Controller and Barkoder for Windows, support the development and printing of LaserBarcodes and CD Barcodes for IBM-PC's & compatibles.

The CD Barcode format is owned and licensed by Sony Corporation. It specifies four (4) CD Barcode commands which are supported by Pioneer's CLD-V2600 & the CLD-V2400.

CD Barcode Commands and Structure

1. Play Track

Function: This CD-Barcode instructs the CLD-V2600 or the CLD-V2400 to search to the beginning of the specified track and play to the end of the specified track.

Explanation: Audio CD's can contain 1-99 tracks. When creating and printing a Play Track barcode the user must specify which track to play back. The barcode development software should prompt the user to enter a two digit number from 01 through 99.

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Macintosh™ is a Trademark of Apple, Inc.

CD Barcode Commands and Structure (cont.)**1. Play Track (cont.)**

Execution: Once the barcode is printed, scanning it will instruct the player to search to the beginning of the specified track, perform a stereo playback of that track, and pause at the beginning of the nexttrack.

Note: The CD Barcode specification allows for only stereo playback of digital audio channels 1 and 2.

Example: The barcode below instructs the player to search to and play back Track 2 on the compact disc. It stops playback at the beginning of Track 3.



Scan this barcode to play back audio Track 2.
Audio setting is stereo.

2. Play From Track

Function: This CD-Barcode instructs the CLD-V2600 or the CLD-V2400 to search to beginning of a specified track and play to the end of the disc.

Explanation: Audio CDs can contain up to 99 tracks. When creating and printing a **Play From Track** barcode the user must specify at which track to begin playback. The barcode software should prompt the user to enter a two digit number from 01 through 99.

Execution: Once the barcode is printed, scanning it will instruct the player to search to the beginning of the specified track and play to the end of the compact disc.

Note: The CD Barcode specification allows for only stereo playback of digital audio channel 1 and 2.

Example: The barcode below instructs the player to search to Track 4 and play to the end of the compact disc.



Scan this barcode to search to audio Track 4 and play to the end of the compact disc.
Audio setting is stereo.

CD Barcode Commands and Structure (cont.)**3. Play Index**

Function: This CD-Barcode instructs the CLD-V2600 or the CLD-V2400 to search to the beginning of the specified index within the specified track and play to the beginning of the next index.

Explanation: Audio CDs can contain up to 99 tracks and each track can be further divided in up to 99 index markers. When creating and printing a **Play Index** barcode the user must specify both the track number and index number to be played. The barcode software should prompt the user to enter a two digit number to specify the track (01 - 99) and a two digit number to specify the index number (01 - 99).

Execution: Once the barcode is printed, scanning it will instruct the player to search to and play back the specified index within the specified track. It will pause playback at the beginning of the next index marker within the track.

Note: Index playback is dependent upon the particular compact disc. Most commercially available compact discs are not encoded with multiple index markers. In fact, most CDs contain only one index per track (which runs the duration of the track). With Barcode control of index playback now possible, more publishers may begin to develop materials that include multiple index markers within each track.

Note: The CD Barcode specification allows for only stereo playback of digital audio channel 1 and 2.

Example: The barcode below instructs the player to search to and play back Track 5&Index 1.



Scan this barcode to play back Track 5&Index 1.
Audio setting is stereo.

4. Play Time Segment

Function: This CD-Barcode instructs the CLD-V2600 or the CLD-V2400 to search to the first specified time number and play to the second specified time number.

Explanation: Audio CDs contain a time number which is comprised of minutes, seconds and blocks. To specify a time number for use with CD barcode command, the user must enter a time number which consists of a 5 digit argument: a two digit number for minutes (00-99), a two digit number for seconds (00-59), and a single digit number for blocks (0-7).

CD Barcode Commands and Structure (cont.)**4. Play Time Segment (cont.)**

The barcode software should prompt the user to enter two 5 digit numbers. The first number indicates the beginning of the segment (MM, SS, B) and the second number indicates the end of the segment (MM, SS, B).

Note: Although there are 75 blocks per second on a compact disc, the CD Barcode format only allows access to the unit 10 block location. Therefore, time number 12340 indicates the 12 minute, 34 second, 00 to 09 block location, time number 12341 indicates the 12 minute, 34 second, 10 to 19 block location, and so on. This is done because all CD players cannot search to the exact block location, therefore, a 10 block range is specified by the last digit.

The CLD-V2600 & CLD-V2400, however, can search&play to the exact block location. Therefore the following performance can be expected when specifying the block digit in CD barcode time numbers:

0 = 00	player will search/ play to block location 00
1 = 10	player will search/ play to block location 10
2 = 20	player will search/ play to block location 20
3 = 30	player will search/ play to block location 30
4 = 40	player will search/ play to block location 40
5 = 50	player will search/ play to block location 50
6 = 60	player will search/ play to block location 60
7 = 70	player will search/ play to block location 70

Execution: Once the barcode is printed, scanning it will instruct the player to search to the first time number and play to the second time number. When it reaches the second time number the player will pause playback.

Example: The barcode below instructs the player to search to time number 12 minutes 34 seconds, 50 blocks and play to 13 minutes, 45 seconds, 20 blocks.



Scan this barcode to search to 12 minutes, 34 seconds, 50 blocks and play to 13 minutes, 45 seconds, 20 blocks.
Audio setting is stereo.

CAUTION: Barcodes, generally, can be photocopied one or two generations and still be scanned with success. Copies should be made at 100%.